

REMARKS

Claims 1-4 and 6-11, 15 and 17 were pending in this application. By this amendment, claim 1 is amended. Claim 6 is cancelled. Upon entry of this amendment, claims 1-4 and 7-11, 15, and 17 are under examination.

Support for the amendment of claim 1 can be found, inter alia, at page 8, line 21 to page 9, line 2; page 36, lines 16-22 of the specification. *See also* page 28, lines 11-13. No new matter is added.

With respect to claim amendments and cancellation, Applicants have not dedicated or abandoned any unclaimed subject matter and moreover have not acquiesced to any rejections and/or objections made by the Patent Office. Applicants expressly reserve the right to pursue prosecution of any presently excluded subject matter or claim embodiments in one or more future continuation and/or divisional applications.

Summary of Interview

Applicants express their gratitude for the telephonic interview between Examiner Myron G. Hill and Applicants' representatives Jian (Janet) Xiao and Steven Smith on May 6, 2009. The time and consideration of the Examiner is greatly appreciated.

During the May 6, 2009 interview, Applicants' representatives discussed key points in the specification and how the claims focused on particular population of birds which is not anticipated by the cited reference. Applicants' representatives submitted that they intended to submit a declaration to demonstrate the difference between the claim and the cited reference. Applicants submit herein as Exhibit 1 a 37 C.F.R. §1.132 declaration by Dr. Ilaria Capua, inventor of the present application and an author of the Capua communication.

Claim Rejections – 35 USC § 102

Claims 1-4, 6, 10, 11, 15 and 17 are rejected under 35 U.S.C. § 102(b) as allegedly being anticipated by Capua et al. (Veterinary Record 2000, 147(26):751, hereinafter referred to as “the Capua communication”). Applicants respectfully traverse this rejection.

Applicants respectfully submit that claims of the present application is limited to the diagnosis of infection with an epidemic (live filed) strain of avian influenza virus (HxNy) in birds that have been vaccinated with a heterologous vaccine (i.e., characterized by the same subtype of viral haemagglutinin and a different subtype of neuraminidase, HxNz).

The Capua communication, by contrast, merely suggests the use of a heterologous vaccine (H7N3) to discriminate between vaccinated birds and those infected with the epidemic H7N1 strain of the virus. Specifically, the Capua communication states,

The presence of a different neuraminidase (N) subtype, which will induce specific antibodies (against N3 rather than N1) will enable us ... to discriminate between infected and vaccinated flocks...” (emphasis added)

Thus, the Capua communication teaches that detection of anti-N3 or anti-N1 antibodies can be used to discriminate whether any given bird has been vaccinated or infected with the epidemic H7N1 strain of the virus. In other words, detection of anti-N3 or anti-N1 antibodies in the bird can be used to discriminate whether a given bird has been vaccinated with H7N3 vaccine (i.e., immunoresponsive to N3) or infected with the epidemic H7N1 strain of virus (i.e., immunoresponsive to N1). It is completely silent about diagnosing avian influenza virus infection in a population of birds which has been subjected to vaccination by means of a heterologous vaccine, let alone any method by which this can be achieved.

Provided herein as Exhibit 1 is 37 C.F.R. §1.132 declaration by Dr. Ilaria Capua, inventor of the present application and an author of the Capua communication. In her declaration (also referred to as “the Capua declaration”), Dr. Capua states that the Capua communication is completely silent about diagnosing avian influenza virus infection in a population of birds which has been subjected

to vaccination by means of a heterologous vaccine, let alone any method by which this can be achieved.. See, e.g., paragraph 5 of the Capua Declaration.

In view of the above, Applicants respectfully request that the rejection under 35 U.S.C. §102(b) be withdrawn.

Claim Rejections – 35 USC § 103

Claims 1 and 7-9 are rejected under 35 U.S.C. §103(a) as allegedly being unpatentable over the Capua communication and Van de Perre et al. (J. Clinical Micro. 1988, 26:552-556, hereinafter referred to as “Van de Perre”). Applicants respectfully traverse this rejection.

As discussed above, the Capua communication is completely silent about diagnosing avian influenza virus infection in a population of birds which has been subjected to vaccination by means of a heterologous vaccine. There is no suggestion that the methods described in the Capua communication can be used to identify birds which have been vaccinated with the heterologous vaccine (H7N3) and subsequently infected with the epidemic field strain of avian influenza (H7N1). Such birds are typically called “healthy carriers” since they do not exhibit any clinical symptoms of infection but can propagate further diffusion of the infection (see page 9, lines 10-21 of the specification). Paragraphs 5-7 of the Capua Declaration.

As stated in the Capua declaration, the greatest challenge facing a skilled person in the field of avian influenza control as of the filing date of the present application was not simply differentiating between vaccinated birds and unvaccinated birds that had been infected with the epidemic field virus strain of avian influenza. Rather, the more significant hurdle of overcome in order to develop an effective and commercially viable vaccine strategy was the provision of a vaccine that allowed the identification of vaccinated birds subsequently exposed to an epidemic field strain of the virus (“the healthy carriers”). Without such a test, vaccinated birds would effectively “hide” outbreaks of the live virus. In other words, there would be no way of detecting live virus outbreaks. Paragraph 6 of the Capua Declaration.

On the other hand, according to the Capua declaration, as of the filing date of the present application, there was no teaching about a sensitive and reliable antibody test which allows diagnosis of viral infection in vaccinated birds. Due to the characteristics of the viral replicative cycle and the occurrence of cross-reactions between neuraminidase groups, it was generally understood that an antigen binding test for neuraminidase would not confer sufficient sensitivity and specificity for a diagnostic test. Paragraph 7 of the Capua Declaration.

Furthermore, according to the Capua declaration, it was unpredictable how the vaccine-induced neuraminidase antibodies would interfere with the production of anti-neuraminidase antibodies following subsequent infection with the field virus strain. Paragraph 8 of the Capua Declaration.

The present application teaches that vaccination with a heterologous vaccine would still permits limited replication of the infecting field virus in the vaccinated bird. According to the Capua declaration, the fact that an intentional slight antigenic mismatch between the vaccine and the field virus haemagglutinin molecules provides a minimal degree of field virus replication and hence a detectable serological response would not have been predictable based on the cited references. Furthermore, the high specificity and low level of cross reactivity among neuraminidases provided by the methods of the present invention would not have been predictable based on the teaching of the cited references. Paragraphs 10-12 of the Capua Declaration.

Van de Perre does not cure the deficiencies of the Capua communication discussed above. Specifically, Van de Perre is cited as allegedly teaching antibody test, and is completely silent about diagnostic method for detecting infection with an avian influenza virus, let alone diagnostic method for detecting infection with an avian influenza virus of a specific epidemic strain (HxNy) in a population of birds which has been subjected to vaccination by means of a heterologous vaccine characterized by the same subtype of viral haemagglutinin (Hx) and a different subtype of neuraminidase (Nz).

Accordingly, Applicants respectfully submit that claims of the present application are not obvious over the Capua communication and Van de Perre, and respectfully request withdrawal of the rejection under 35 U.S.C. §103.

CONCLUSION

In view of the above, each of the presently pending claims in this application is believed to be in immediate condition for allowance. Accordingly, the Examiner is respectfully requested to withdraw the outstanding rejection of the claims and to pass this application to issue. If it is determined that a telephone conference would expedite the prosecution of this application, the Examiner is invited to telephone the undersigned at the number given below.

In the event the U.S. Patent and Trademark office determines that an extension and/or other relief is required, applicant petitions for any required relief including extensions of time and authorizes the Commissioner to charge the cost of such petitions and/or other fees due in connection with the filing of this document to Deposit Account No. 03-1952 referencing docket no. 404172000300. However, the Commissioner is not authorized to charge the cost of the issue fee to the Deposit Account.

Dated: July 17, 2009

Respectfully submitted,

Electronic Signature: /Jian Xiao/
Jian Xiao

Registration No.: 55,748
MORRISON & FOERSTER LLP
755 Page Mill Road
Palo Alto, California 94304-1018
(650) 813-5736